DOCUMENT RESUME

ED 049 501 CG 006 313

AUTHOR	Mendel, Raymond M.; Dickinson, Terry L.
TITLE	The Motivational Determinants of Task Performance in a Non-Industrial Milieu: A Modification and Extension of Vroom's Model.
INSTITUTION	Iowa State Univ. of Science and Technology, Ames.
PUB DATE	May 71
NOTE	10p.; Paper presented at the Midwestern Psychological Association Convention in Detroit, Michigan, May 6-8, 1971
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	*Models, *Motivation, Perception, Performance, *Performance Criteria, *Performance Factors, *Self Actualization, Self Concept, Self Esteem, Self Evaluation, Social Reinforcement

ABSTRACT

Vroom's cognitive model, which proposes to both explain and predict an individual's level of work productivity by drawing on the construct motivation, is discussed and three hypotheses generated: (1) that Vroom's model does predict performance in a non-industrial setting; (2) that it predicts self-perceived performance better than measures externally derived; and (3) that a measure of self-rated expectancy improves the predicitve power of the model. All three hypotheses were confirmed on a sample of 33 members of a university wrestling team. Interviews and questionnaire were used to collect relevant data from team members and coaches. Sample items from the questionnaire are included. (TI)

ED049501

THE MOTIVATIONAL DETERMINANTS OF TASK PERFORMANCE IN A NON-INDUSTRIAL MILIEU: A MODIFICATION AND EXTENSION OF VROOM'S MODEL

By

Raymond M. Mendel

and

Terry L. Dickinson

Iowa State University

Paper presented at the 43rd Annual Meeting of the
Midwestern Psychological Association
Detroit, May 6-8, 1971

CG 006 313

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

Vroom's model purposes to both explain and predict an individual's level of work productivity by drawing on the construct, motivation. Beginning with the premise that most work behavior is voluntary, and thus motivated, the theory is aimed at identifying the underlying components of this motivational base. The model delineates the manner in which these underlying components combine, resulting in a ubiquitous force upon the individual. The behavioral manifestation of this force is revealed in the amount of effort expended to achieve some desired performance level.

More specifically, an individual's motivation to perform at some given level can be explained, Vroom contends, by defining those outcomes or consequences which the individual associates with that performance level. The degree to which any one of these outcomes actually contributes to the motivational base is a multiplicative function of two factors: the valence or anticipated satisfaction or dissatisfaction to be derived from that outcome, and the perceived probability that the outcome will or will not be realized upon attainment of a given level of performance. Vroom refers to this latter notion as the instrumentality of performance level "X" for the attainment of outcome "Y". Thus, for example, in order for supervisor approval to serve as a motivator or inducement for high performance, the worker must both desire the supervisor's praise (positive valence), and also feel that increased performance will increase the probability of receiving this approval (positive instrumentality). In addition to these notions about the motivating function of associated outcomes, the model also states that the individual must feel that he has control over his performance level. This is denoted in the model as expectancy. In the context of the previous example, even though the subject desires a supervisor's approval and sees it as contingent upon performing at a certain level, this outcome will not motivate him unless he feels he is capable or has the potential to achieve the necessary performance criterion.

Previous attempts to determine the validity of Vroom's model have been conducted either in actual industrial settings (Galbraith & Cummings, '67; Hackman & Porter, '68) or in "experimental simulations" of industrial environments (Graen, '69). This trend is not surprising since when Vroom introduced the model in 1964, the primary emphasis was placed on its application in industrial-organizational contexts. However, it is our contention that there are no intrinsic characteristics of the model which should restrict its utility solely to industrial environments. On the contrary, the model should be an equally powerful tool in virtually any performance setting.

Consequently, one of the purposes of this study was to extend the validity of the model through an assessment of its predictive power in a non-industrial milieu. A second goal was to test a proposed modification of the theory. Vroom's model has been evaluated in terms of its ability to account for variations in performance. Without exception, the measure of performance predicted was derived by some external, often called objective means, for example, unit-output records. However, the model Vroom espouses is distinctly cognitive. Emphasis in all the independent measures is on the perceptions or cognitions of the individual, that is, self-rated valence, self-rated instrumentality, and self-rated expectancy. Hence it is with some trepidation that this author learns that in the quantification of the dependent variable productivity, the perceptions of the focal individual are completely ignored.

Is it not reasonable to view cognitively derived, self-perceived performance as an intervening variable between the motivational base and "objective" performance. Vroom argues that a worker adjusts his performance to a force impinging upon him to attain a certain level of output. But performance for the individual is defined by his perceptual and cognitive processes. It therefore seems defensible that it is this cognitive index of performance that the worker adjusts to this force, and as a result it is this measure of performance that is in fact predicted

by the theory. What success the model has enjoyed as a predictor of various other indicies of performance may reasonably be explained by the sizable correlation extant between self and other ratings of this variable (Parker, '59; Koppel, '70). The present study was designed to generate some data relevant to this question.

A final purpose was to examine the contribution made by the expectancy notion. Galbraith and Cummings ('67) conducted an investigation which provides heretofore, the most complete test of Vroom's model. Unfortunately, they failed to measure expectancy. It was their contention that the research setting in which the study was conducted was such that their subjects had complete freedom to regulate their output level. Consequently, they simply assumed expectancy was equal to unity. While objectively this assumption may be justified, the model calls for perceived, not objective expectancy. Their subjects, for a wide variety of reasons, may not have felt that their rate of output was entirely under their own control. Consequently, although they did find some evidence for the model, its potential efficacy may well have been attenuated.

In the present study, although we too felt expectancy might equal unity, a measure of the subject's perception was included.

In sum then, the present endeavor addresses itself to three issues. First, would Vroom's model predict performance in a non-industrial setting? Second, does the model in fact predict self-perceived performance better than measures externally derived? And finally, will a measure of self-rated expectancy improve the predictive power of the model?

Procedure

Thirty-three members of the Iowa State University Wrestling Team completed questionnaires designed to yield the information required by the model. The five performance related outcomes about which data were collected were derived through interviews with former team members and the three team coaches. These outcomes are: 1) support from coaches, 2) respect of teamates, 3) winning matches,

4) making the starting team, and 5) becoming too tired to study after practice. Presumably this last outcome was negatively valent, although admittedly for some of these athletes, the obverse is true. The dependent variable was defined as the amount of effort put forth in daily practice sessions by a wrestler. Ratings on this variable, as well as on ability were collected for every wrestler from each of the three team coaches. In addition, each wrestler indicated in the questionnaire how he perceived his own relative level of effort. Sample items from the questionnaire are shown in the handout.

After transformation of all scores to deviation form, a test of the applicability of Vroom's model in this setting was made by regressing coach-rated effort on the full model. This is labeled Eq 1 in the handout.

A second regression, Eq 2, was run on self-rated effort and a comparison of the multiple r^2 from this regression was made with the r^2 obtained in Eq 1. This provided a test of the hypothesis that the model predicts self- not coach-rated effort.

Finally expectancy was deleted from the model to test for the hypothesized loss of predictive power when this variable is assumed to equal unity.

Results and Discussion

Since it is our position that a modification in the definition of the dependent variable is needed, let us examine this point first. This will enable us to discuss the remaining hypotheses in light of the model which proves to be more appropriate.

Vroom's full model was regressed on coach-rated and then self-rated effort. Subsequently, a test devised by Pitman was employed to test for a significant difference in variance explained by the two models. The results are displayed in Table 1. As can be seen, the residual variance from the regression on coach-rated effort is significantly greater than that remaining after the regression on self-rated effort ($t=3.04; df=26; p < .01$). Thus the hypothesis that Vroom's model is a better predictor of self-rated effort is confirmed. How are we to interpret this finding?

On the one hand, we can view the model as a predictor of perceived performance, as has been argued. If we do, then by definition self-ratings are more appropriate. However, if we choose to regard performance as a behavorial rather than a cognitive construct as above, what relevance has this finding?

If we take a behavioristic approach to performance, we assume that there is some "true" level of performance that describes each wrestler. Our problem then becomes one of finding the better estimate of this true level. Assuming that self-ratings do provide a better estimate of true performance than do coach-ratings, several possible explanations for this exist.

One conceivable explanation is that through definitional confusion over the construct to be rated, that is, effort, the coaches were actually rating a slightly different construct than were the wrestlers. Since the two ratings had only 50% of their variance in common, this explanation seems viable. However, when we correct for the attenuation due to the unreliability of each measure, they correlate perfectly. Hence, the explanation that we have estimates of two different constructs seems unlikely.

Differential method variance might also explain the discrepancy between the predictability of coach-rated versus self-rated effort. There is some evidence that self-ratings on a number of dimensions correlate more highly with one another than self and other ratings on these dimensions (cf. Koppel & Sechrest, '70). Consequently, we might expect a greater correlation between self-rated effort and the self-rated variables of expectancy, valence, and instrumentality than obtained with the heterogeneous combination of coach-rated effort and self-rated independent variables. In short, in the former case we need only contend with trait variance, whereas in the latter, both method variance (different raters) and trait variance are potential sources for error in our measures. In this study it is not possible to determine the degree to which this differential method variance has forced the obtained results.

A final explanation for the superiority of self-rated effort as a criterion is that this estimate of true effort has greater criterion relavance. It is this account that we endorse. Since the individual wrestler has a far larger sample of his "effort" behavior than does a coach who must observe an entire team, it is likely that his estimate is a better approximation to true effort. Furthermore, it is difficult for a coach to separate effort from ability in his ratings. For example, two wrestlers may appear to be working equally hard, but if one is shorter-winded than the other, he must exert greater effort. Certainly a wrestler rating himself is in a better position to take these considerations into account.

Presuming for the moment that in the last five minutes I have succeeded in establishing self-ratings as the more appropriate criterion in the model, let us now turn to the remaining hypothesis.

The second major question addressed in this endeavor concerned the applicability of Vroom's model to a non-industrial milieu. When the self-rated effort was regressed on the full model, a correlation of .65 resulted. As is shown in Table 1, this is significant beyond the .025 level. The hypothesis that the model is applicable in a non-industrial setting was thereby confirmed.

Finally, the hypothesis that the actual measurement of expectancy would improve the predictive power of the model also received confirmation. Significanlty more variance was explained when expectancy was included in the regression equation than when it was omitted, $F_{6,20}=3.23$, $p < .025$ (compare Table 1 with Table 2). This finding underscores the importance of actually measuring all constructs in a cognitive model, regardless of the confidence of the experimenter in his ability to anticipate the nature of the resulting data.

In sum then, all three hypothesis were confirmed. Vroom's model appears to be a useful tool in divergent performance settings, industrial and otherwise. Furthermore, the data suggest that the model does in fact predict self-rated or perceived performance rather than other performance criteria. And last, perceived expectancy, it appears, must be measured in each test of the model in order to do justice to the theory.

SAMPLE ITEMS FROM "DETERMINANTS OF WRESTLING PERFORMANCE QUESTIONNAIRE"

Valence item: Listed below are several things which could result from working hard in practice:

a) You could receive the support and consideration of the coaches.
b) You could be popular and respected by your teammates.
c) You could win more matches.
d) You could make the first team.
e) You could become too tired to study in the evenings.

1) Rank the above items in the order in which you prefer them (most to least). Do so by placing the underlined word in the spaces provided.
2) Draw lines from each word to the scale point indicating how much you prefer these outcomes. You may draw more than one line to any scale point.

1 _____
2 _____
3 _____
4 _____
5 _____

- extremely desirable
- very desirable
- desirable
- does not matter whether I receive it or not
- undesirable
- very undesirable
- extremely undesirable

Instrumentality item:

TO WHAT DEGREE DOES EARNING THE RESPECT OF YOUR TEAMMATES DEPEND UPON THE AMOUNT OF EFFORT YOU PUT FORTH IN PRACTICE? Indicate your answer by drawing a line from "effort-respect" to a point on the scale which best describes your feeling.

effort-respect

- I feel the harder I work in practice, the more respect I will earn from my teammates.
- I feel that working hard in practice is important in earning the respect of my teammates, but this respect is earned in other ways as well.
- I don't think the amount of respect my teammates have for me is affected one way or another by how hard I work in practice.
- I feel that working hard in practice could reduce the amount of respect my teammates have for me.
- I feel that working hard in practice would definitely reduce the amount of respect my teammates have for me.

Expectancy item:

SHOULD YOU DECIDE TO WORK MUCH HARDER IN PRACTICE, WHAT PER CENT OF THE TIME DO YOU THINK YOU WOULD ACTUALLY BE ABLE TO DO SO?

___0% ___10% ___20% ___30% ___40% ___50% ___60% ___70% ___80% ___90% ___100%

Table 1 Regression of coach-rated (Ef_c) and self rated (Ef_s) effort on full model

Eq. 1) $Ef_c = -.17 - .00X_1^* + .40X_2 - .16X_3 + .39X_4 + .07X_5 + .08X_6$

$R^2 = .32$; $df = 6, 26$; $p < .12$

Eq. 2) $Ef_s = -.01 - .00X_1 + .38X_2 + .01X_3 - .07X_4 + .04X_5 + .34X_6$

$R^2 = .42$; $df = 6, 26$; $p < .025$

*X_1 = (E)(A)(Ego)
X_2 = (E)(A)(V-I-tired)
X_3 = (E)(A)(V-I-varsity)
X_4 = (E)(A)(V-I-respect)
X_5 = (E)(A)(V-I-support)
X_6 = (E)(A)(V-I-winning)

Pitman - significance test for differences in the variance explained by Equations 1 and 2

$t = 3.04$; $df = 26$; $p < .01$

Table 2 Regression of coach-rated (Ef_c) and self-rated (Ef_s) effort on model with expectancy deleted

Eq. 3) $Ef_c = -.15 - .09X_1^* + .58X_2 - .33X_3 + .53X_4 - .04X_5 + .86X_6$

$R^2 = .12$; $df = 6, 26$; $p < .50$

Eq. 4) $Ef_s = -.16 - .09X_1 + .45X_2 + .05X_3 + .18X_4 + .17X_5 + .63X_6$

$R^2 = .14$; $df = 6, 26$; $p < .50$

*X is same as in Table 1.

REFERENCES

Galbraith, J. and Cummings, L. L. An empirical investigation of the motivational determinants of task performance: Interactive effects between instrumentality-valence and motivation-ability. Organizational Behavior and Human Performance, 1967,2, 237-257.

Graen, G. Instrumentality theory of work motivation: Some experimental results and suggested modifications. Journal of Applied Psychology Monograph, 1969, 2.

Hackman, J. and Porter, L. Expectancy theory predictions of work effectiveness. Organizational Behavior and Human Performance, 1968, 3, 417-426.

Koppel, M. A. and Sechrest, L. A multi-trait-multimethod matrix analysis of sense of humor. Educational and Psychological Measurement, 1970, 30, 77-86.

Parker, J. W., Taylor, E. K., Barrett, R. S., and Mattens, L. Rating scale content: III. Relationships between super-visory- and self-ratings. Personnel Psychology, 1959, 12, 49-63.

Pitman, E. J. A note on normal correlation. Biometrika, 1939, 31, 9-12.

Vroom, V. H. Work and Motivation. New York: John Wiley and Sons, 1964.